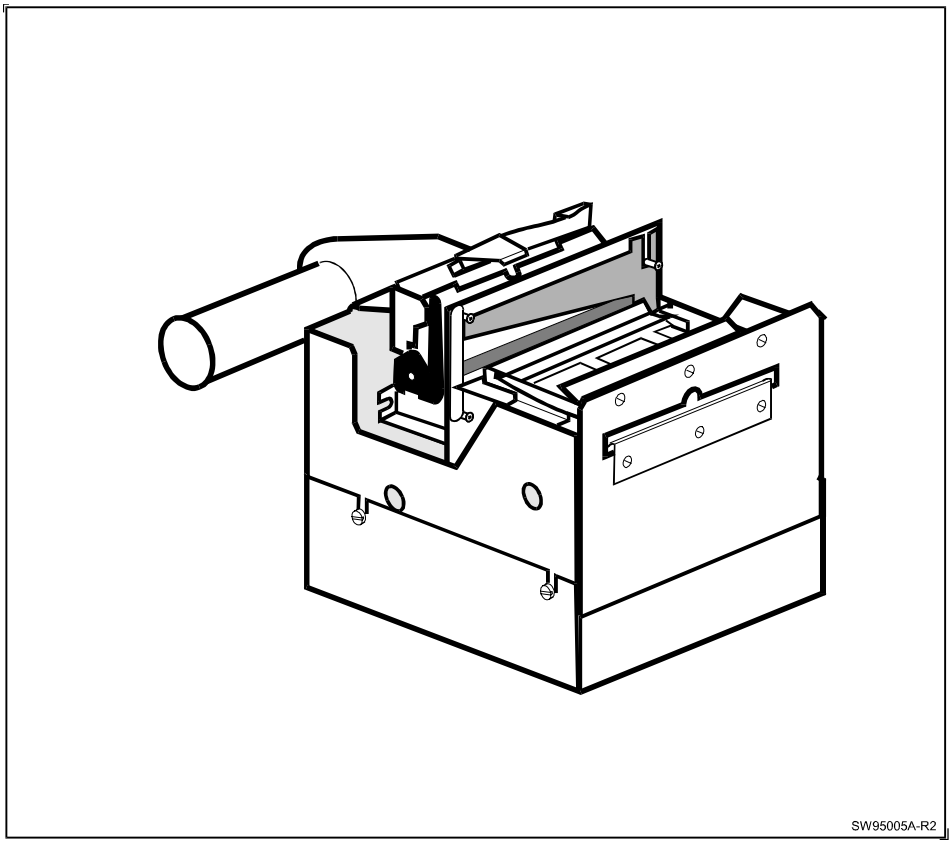
TTP 5200/5250 Kiosk Printer Sub-system

Technical Specification



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Related manuals

- ***TTP 5100/5200/5250 Operating Instructions*** *01434-000 old No. 38-1081-00)*
- ***TTP 5200/5250 Installation Manual*** *01436-000 (old No. 38-1061-00)*
- ***TTP 5000 Series Service Manual*** *00803-000 (old No. 38-1151-00)*

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1 INTRODUCTION

The TTP 5200 and 5250 printers are designed primarily for being used as printing devices in public access terminals. Typical applications are vending machines, ticket issuing machines, information terminals and other devices operated by the public. One of the main features of TTP 5200/5250 is the patented presenter module that prevents the document from being exposed to the customer until the whole document is printed and separated. The TTP 52x0 Series printer can be downloaded on-line with firmware, default parameters, logotypes, and character fonts.

NOTE! — *The manual also applies to the discontinued TTP 5100 printer except information regarding on-line downloading of firmware, default parameters, character font sets, and logotypes. Software commands that cannot be used with the TTP 5100 are marked* ~~**TTP 5100**~~*, but only in the list in Chapter* ***12*** *on page 13.*

1.1 TTP 5200 and 5250 models

This specification describes the standard types of the printer versions TTP 52x0/60, TTP 52x0/80, and TTP 52x0/112. The sub numbers 60, 80 and 112 refer to the paper width. The TTP 52**00** printers require 5 VDC and 24 VDC input whereas TTP 52**50** printers require 24 VDC only.

1.2 Printer design

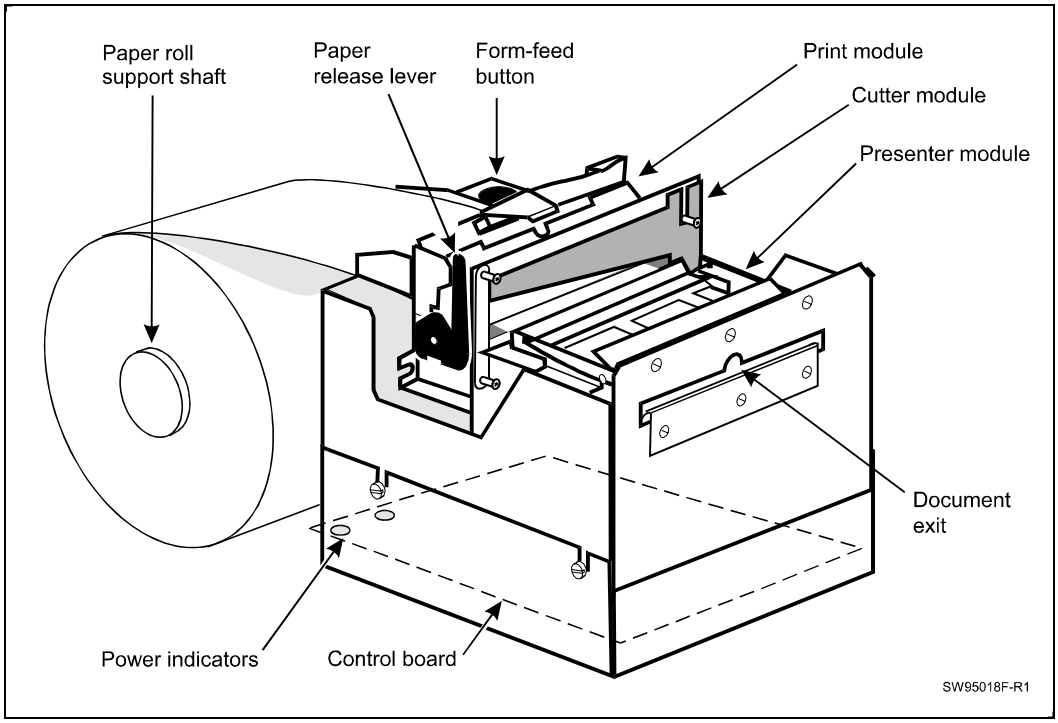


Figure 1. TTP 52x0 printer design

The basic printer control board has an RS232 serial interface and a Centronics-type parallel interface (SPP).

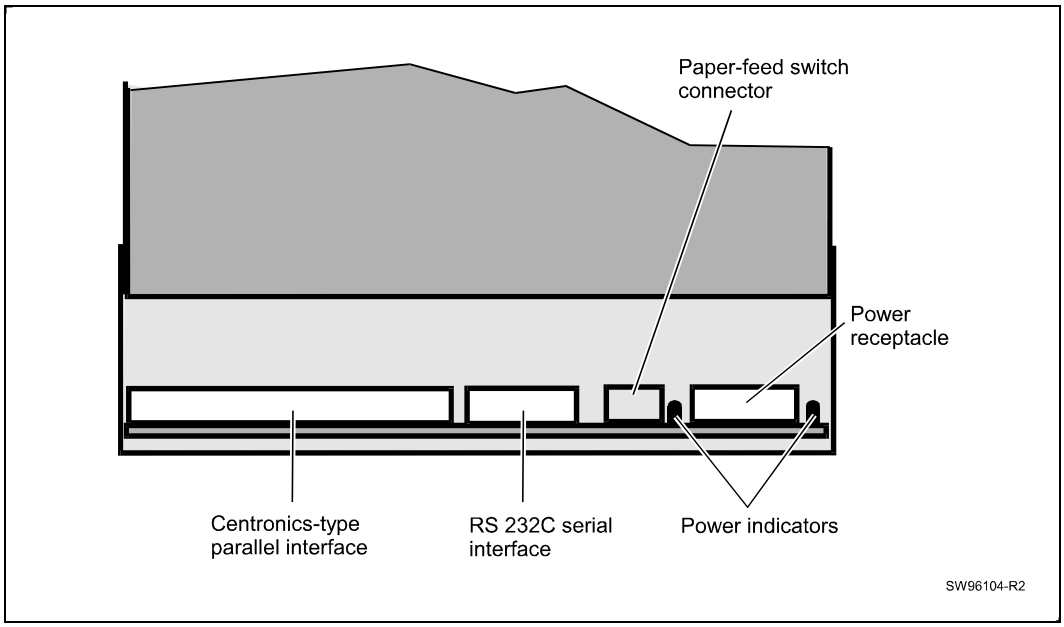


Figure 2. Data communication interface connectors (rear view)

The printer operation to a large extent depends on the current status of a number of built-in sensors:

1.3 Installation considerations

These printers should be installed in some kind of enclosure such as a self-service kiosk.

Preventing ESD and earth currents from affecting the printer operation requires proper connection of the printer chassis to protective earth through a mounting platform or through a separate earth conductor.

Troublefree printer operation also requires that the printer's optical sensors be shielded from ambient light (see Chapter 7).

Additional space is required for paper replenishment and paper jam removal (see Chapter 17). Consider mounting the printer on a movable platform so that the printer can be maintained outside the printer enclosure.

2 PRINT DATA

Printing method	Direct, parallel, thermal print, resolution 8 pixels/mm, 0.125 mm/pixel
Print speed	Up to 50 mm per second Examples: – TTP 52x0/80, length 100 mm, portrait: appr. 3.4 seconds – TTP 52x0/112, length 210 mm, landscape: appr. 8 seconds
Paper transport speed	Up to 50 mm per second
Line feed speed	Appr. 35 ms/line at 18 lines/inch (default) Appr. 70 ms/line at 9 lines/inch (double default height)
Print window width	Model -/60 56 mm (448 pixels) Model -/80 72 mm (576 pixels) Model -/112 104 mm (832 pixels)

3 BASIC FUNCTIONS

Basic character set	IBM Character Set II
National characters	13 substitute sets
Bar codes	EAN8/13, (UPC-A), and Code 39
Others	On-line load of firmware, default-parameters, character sets, and logotypes to flash PROM. Drivers are available for printing under Windows 3.1, Windows 95/98, and Windows NT 4.0.
Print formats	Portrait and landscape print modes are software selectable. Portrait or landscape print mode default selection can be specified as part of the default parameter settings. In portrait print mode, the ASCII print lines are placed perpendicular to the paper transport direction. In landscape print mode the ASCII print lines are placed parallel to the paper transport direction.
Page format	In portrait mode, the page length can be set to fixed or variable length through software commands. In landscape print mode, the page length (perpendicular to the paper feed direction) is 60, 80 or 112 mm, depending on printer model.

	In landscape print mode, the page buffer capacity limits the page width (in the paper transport direction) to 220 mm. Standard setting is at 210 mm equal to DIN A4 width.
Fonts	Factory installed standard appr. 10, 12, 15 CPI proportional and 25 CPI fixed. Contains characters from decimal positions 32 through 255. Refer to test printout. Nominal character sizes are W x H (20x30, 16x24, 13x20 and 8x12 pixels). Double-height, double-width, quadruple, reversed, n x height, n x width, underlined, in both portrait and landscape. User defined character fonts can be installed for a total of 8 font addresses.
	NOTE! *— The total font storage capacity is 64 Kbyte, including customer defined and factory-installed fonts.The ammount of free font memoty are stated on the test printout.*
Graphics	Model -/80 448 pixels per line, (203 pixels/inch) Model -/80 576 pixels per line, (203 pixels/inch) Model -/112 832 pixels per line, (203 pixels/inch)
Page memory	256 Kbyte RAM Page size capacity in landscape mode is up to 256 Kbyte, corresponding to 220-mm paper length in paper transport direction for -/60, -/80 and -/112 models. In portrait mode there are no memory related page length limitations, however, if the printed document exceeds appr. 250 mm in length, the presenter motor is automatically switched ON in slow mode.
Software commands	Single-byte commands and ESC sequences
Printer buffer capacity	256 bytes
Hex dump mode	Prints received data as Hex representation and ASCII
Test print-out	Obtained by keeping the form feed key depressed at power ON. Includes listing of default parameters and character parameter settings.
Paper feed accuracy	Step length 0.125-mm +0 –1.5%
Options	200 mm paper roll diameter with near-paper-end sensor and adjustable paper level monitor (weekend sensor). Mechanical shutter, preventing objects from being inserted from the front of the printer into the presenter.

4 PAPER SPECIFICATION

4.1 General

Paper supply	Thermo sensitive roll paper (with or without black marks or punched holes for TOF-detection)
Type of paper	TF50KS-E2C, AF50KS-E or equivalent is recommended
Number of layers	One
Paper color	White. Other colors, not interfering with TOF mark, if applicable.
Paper weight	55—110 g/m²
Paper thickness	0.054—0.10 mm
Surface smoothness	450 s minimum according to Bekk TAPPI T 479
Reflection	80% minimum according to SCAN P3
Paper cutting	See page 9

4.2 Thermal coating

Thermal coating	Outer side
Sensitivity	Activated at appr. 68 ºC, saturated at appr. 75 ºC.
Dynamic sensitivity	1.14 ±0.04 OD
Top coating	Standard, semi or UV (if applicable)

4.3 Paper dimensions

Paper width	Model dependent, 60, 80 or 112 mm. All widths +0/–0.3 mm.
Outer roll diameter	Standard 135 mm. Option: 135— 200 mm.
Core inner diameter	Standard 25 mm (40 mm with 135—200 mm roll options)
Paper length	Appr. 190 m for 135 mm roll diameter and 60 g/m² Appr. 450 m for 200 mm roll diameter and 60 g/m²
Core	Paper or plastic
Paper end	Must not be glued to the core

4.4 Preprinting

General	Due to the heat developed during printing, the preprint shall meet the requirements applicable for preprinting on paper intended for laser printing. OCR-blind ink shall be used. Ink used for preprinting on the thermal side shall be non abrasive. The ink shall not smear while wound up on the supply roll, or during the printing process. Ink used for preprinting in the TOF-mark zone (see page 8) shall have no influence on the TOF-sensor (OCR blind ink).
Print side	One side or both sides. Printing is not recommended in the TOF-mark zone on the inner side (see page 8) unless the above conditions are met.
Paper level sensor area	No preprint is allowed on any side of the paper in a 2 mm wide area from the right edge of the paper roll (on the side where the paper low and weekend sensors are situated).

4.5 Perforation

Tear-off perforation	Punching shall be done from outer side (thermo coating side) with a sharp perforation tool.

4.6 TOF detection (if used)

General	Black marks or holes can be used to position the paper before cutting. There shall be one mark or hole for each document to be printed. The size and position is given below.
Print side for black marks	Inner side (opposite to thermal coating side)
Density of black marks	Standard wet offset mode is recommended for printing of the mark. The full mark area must be printed. Screen-printing is not allowed. Measurement of print density shall be performed relative to the white paper background. Using a MacBeth densitometer, the print density shall be grater than 1.3. Anti-gloss filter is not allowed. Using a Gretag densitometer, the print density shall be greater than 1.5. The reflection from the black mark shall be less than 10%. The reflection from the paper shall exceed 80%. Preprinting in the zone passing over the TOF sensor is not recommended. If required, OCR blind type of ink shall be used, (outside 700-1100 nm range).
Holes	Punching shall be done from the thermo-coating side. Distorted print can be expected within a zone of approximately 2-mm around the edges of the hole. The function shall be tested.

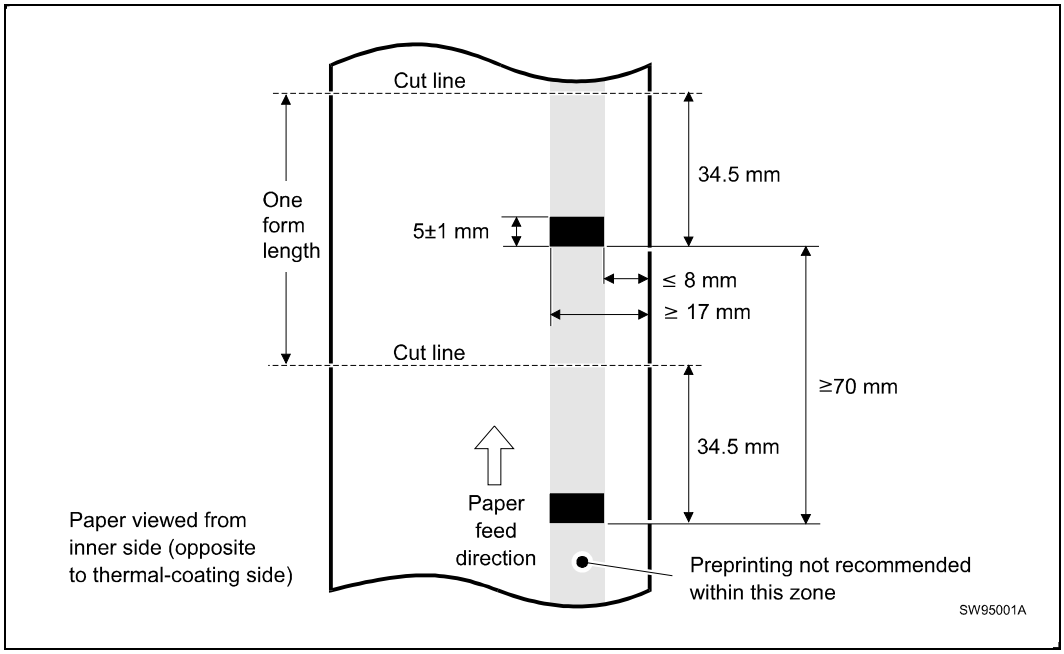


Figure 3. Top-of-form mark

5 PAPER SEPARATION

Cutter	Guillotine-type DC-motor operated with cam shaft, microswitch-controlled
Cut position	17 mm after print line, 33 mm after TOF sensor position
Cutter life expectancy	500 000 cuts or more

6 DOCUMENT PRESENTATION

Presenter module	Controls variable-length documents (70—600 mm) during printing. Printing, cutting, and feed-out operations can be controlled individually by software commands. In combination with a patented loop-building mechanism, the document can be saved inside the printer until printing and separation have been completed. The paper chute is cleared by software command, for example, before start of document printing. Option. Mechanical shutter which prevents insertion of objects from the front of the printer.
Paper jam detection	The printer features a paper jam detection function. Paper jam is assumed if the presenter sensor has not detected the leading paper edge after 128-mm paper advance. Printer operation is interrupted, and error is indicated in the Status Enquiry Response.

7 SENSORS

Print head temperature	Thermistor in print head
Print head lifted position	Microswitch
Paper end & top-of-form	Reflector sensor
Cutter-home position	Microswitch
Presenter control	Reflector sensor
Paper near end	Opto sensor, activated 1—2 m from paper end (see figure 4.
Paper level monitor (option)	For 200 mm roll option only. Adjustable optical sensor. Activated 30—150 m from paper end. See figure 5.

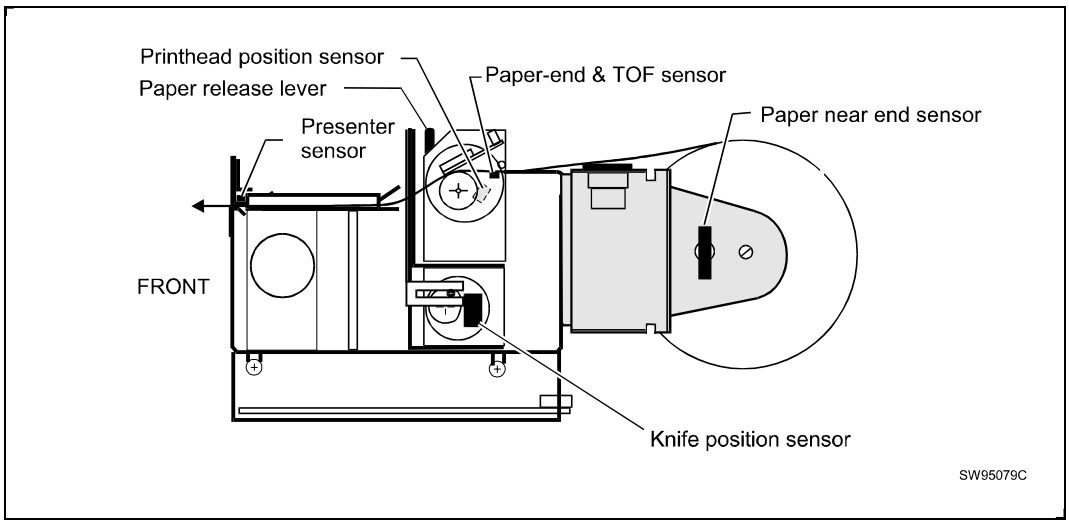


Figure 4. Sensors

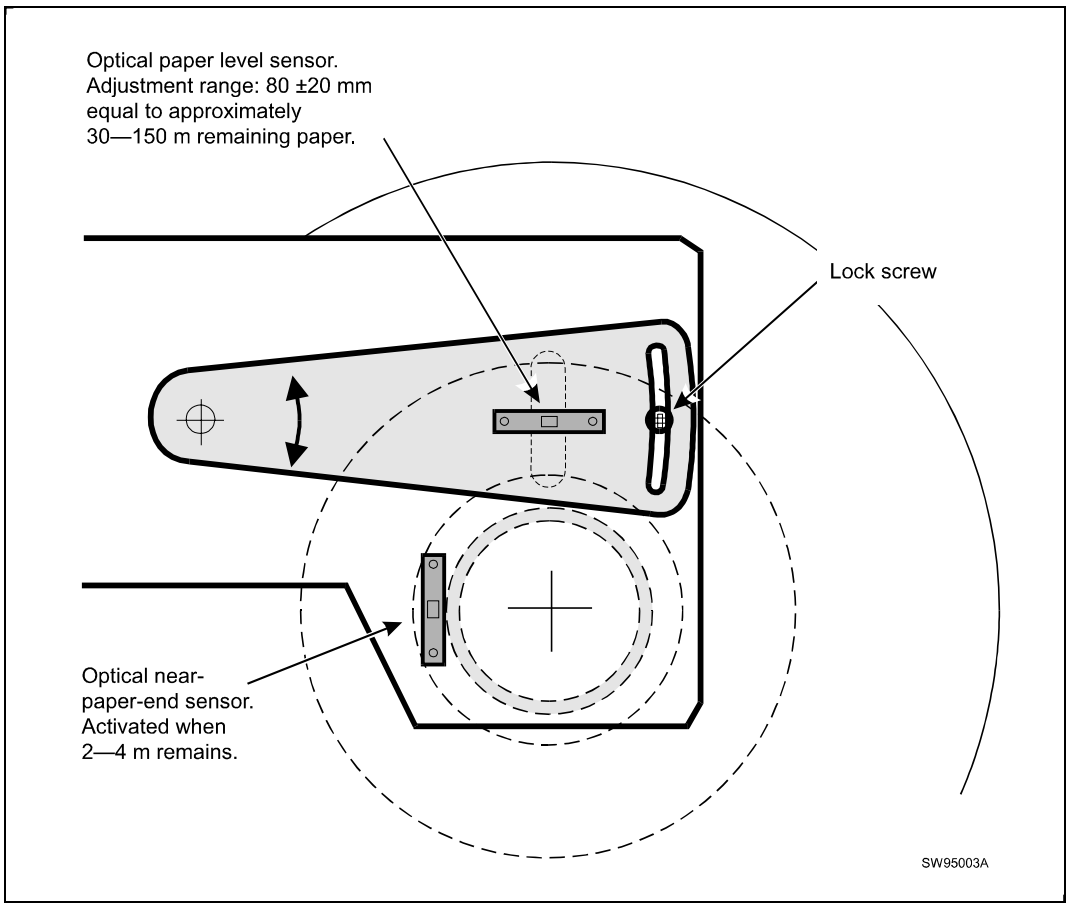


Figure 5. Paper-near-end and weekend sensors (with optional 200 mm roll holder)

8 CONTROL BOARD

Interface	Centronics type parallel and Serial: RS232C, (V.24)
Serial interface data format	8 data bits, 1 start bit, 1 stop bit, and selectable parity
Transmission speed	1200 — 57600 baud, selectable
Handshaking	Hardware (RTS/CTS) and software (XON/XOFF)
Page memory	256 Kbyte RAM
Voltages	Logic 5 VDC, 300 mA
	Print head and motors 24 VDC, average 2A, peak 6—10 A
Voltage indicators (LEDs)	+5V (green) and +24 V (red)

9 POWER REQUIREMENTS

24 VDC ±5%	Text printing	Average 2A, peak 6A
	All black printing	
	– 60 mm paper width	6A
	– 80 mm paper width	6A
	– 112 mm paper width	10A
5 VDC ±5%	300 mA (5V required for TTP 5200 only. TTP 5250 printers have an onboard 5V regulator).	
Power connector	6-pin Molex KK type connector, 2.54 mm division. Positioned at the rear edge of the control board.	
Protection class	I	

10 ENVIRONMENTAL CONDITIONS

Temperature	Operation	+5 °C to +40 °C
	Storage	–10 °C to +50 °C (without paper)
	Transportation	–10 °C to +50 °C (without paper)
Relative humidity	Operation	35–75%, non-condensing
	Storage	10–90%, non-condensing (without paper)
	Transportation	10–90%, non-condensing (without paper)
Shock and vibration	Vibration tolerance during operation: From 5 to 18 Hz with a displacement of 0.3 mm From 19 to 100 Hz at a constant acceleration of 0.2 g, peaked, swept sine wave Shock during shipping: Printers that are factory packaged for shipment can tolerate a drop of 800 mm without sustaining any damage	

11 STANDARDS, LICENSES, ETC.

Safety standards	IEC950 certified, EN50082-1
EMC / EMI	EN55022/B, EN50082-1, EN50082-2

12 SUMMARY OF CONTROL CODES & ESCAPE SEQUENCES

12.1 Character and bit-image mode commands

Code	Hex	Decimal	Function	Remark
HT	09	9	Horizontal tabulation	
LF	0A	10	Line feed	
CR	0D	13	Carriage return	
FF	0C	12	Form feed	
RS	1E	30	Cut and eject paper	
SI	0F	15	Reset from double-width print mode	
SO	0E	14	Set double-width print mode	
ENQ	05	5	Clear presenter	
CAN	18	24	Cancel	
ESC NUL	1B 00	27 0	Download firmware	~~TTP 5100~~
ESC ! n	1B 21 n	27 33	Set character parameters	Limited function in TTP 5100
ESC & NUL	1B 26 00	27 38 0	Download character set	~~TTP 5100~~
ESC & 1	1B 26 01	27 38 1	Download user defined logotype	~~TTP 5100~~
ESC & 2 n1...41	1B 26 02 n1...n41	27 38 2 n1...n41	Download default parameters	~~TTP 5100~~
ESC & 4	1B 26 04	27 38 4	Store current parameter values in flash PROM	~~TTP 5100~~
ESC & C	1B 26 43	27 38 67	Erase all character sets	~~TTP 5100~~
ESC & D	1B 26 44	27 38 68	Erase character sets 4—7	~~TTP 5100~~
ESC & L	1B 26 4C	27 38 76	Erase all downloaded logotypes	~~TTP 5100~~
ESC 3 n	1B 33 n	27 51	Set line spacing	
ESC ?	1B 3F	27 63	Reset (full)	
ESC @	1B 40	27 64	Reset (partial)	
ESC a n1 n2	1B 61 n1 n2	27 97 n1 n2	Set page width, landscape mode	
ESC C n1 n2	1B 43 n1n2	27 67 n1 n2	Set page length, portrait mode	
ESC c n	1B 63 n	27 99 n	Variable document length ON/OFF	
ESC d n	1B 64 n	27 100 n	Execute n line feeds	
ESC ENQ 1	1B 05 01	27 5 1	Status enquiry	

Code	Hex	Decimal	Function	Remark
ESC ENQ 2	1B 05 2	27 5 2	Status enquiry, paper near end	
ESC ENQ 3	1B 05 03	27 5 3	Parameter setting data enquiry	
ESC ENQ 4	1B 05 04	27 5 4	Character sets and logotype enquiry	
ESC ENQ 5	1B 05 05	27 5 5	Paper near end enquiry	
ESC ENQ 6	1B 05 06	27 5 6	Status inquiry	
ESC ENQ 7	1B 05 07	27 5 7	Program version enquiry	
ESC ENQ 8	1B 05 08	27 5 8	Presenter clear enquiry	
ESC F n1..nx NUL	1B 46 n1...nx 00	27 70 n...nx 0	Set horizontal tabs	
ESC f n	1B 66 n	27 102 n	Presenter function	
ESC FF n	1B 0C n	27 12 n	Eject only	
ESC g	1B 67	27 103	Print logotype	
ESC h n	1B 68 n	27 104 n	Set multiple-height print mode	
ESC J n	1B 4A n	27 74 n	Paper advance	
ESC j n	1B 6A n	27 106 n	Paper reverse	
ESC O n1 n2	1B 4F n1 n2	27 64 n1 n2	Absolute line positioning	
ESC q n	1B 71 n	27 113 n	Burn time adjustment	
ESC R n	1B 52 n	27 82 n	Select national character set	
ESC RS	1B 1E	27 30	Cut paper (no eject)	
ESC S n1 n2	1B 53 n1n2	27 83 n1 n2	Select graphics mode	
ESC SI	1B 0F	27 15	Reset from double-height print mode	
ESC SO	1B 0E	27 14	Set double-height print mode	
ESC T n	1B 54 n	27 84 n	Reversed print mode on/off	
ESC W	1B 57	27 87	Windows mode on/off	

12.2 Label and other top-of-form oriented commands

Code	Hex	Decimal	Function
ESC A n1n2n3	1B 41 n1n2n3	27 65 n1n2n3	Set label (block) length
ESC BC b1	1B 42 43 b11	27 66 67 b1	Clear bar code field
ESC BS b1...b11	1B 42 53 b1...b11	27 66 83 b1...b11	Reserve bar code field
ESC BW b1...NUL	1B 42 57 b1...00	27 66 87 b1...0	State bar code data
ESC DC d1	1B 44 43 d1	27 68 67 d1	Clear comment field
ESC DS d1...d7	1B 48 53 d1...d7	27 68 83 d1...d7	Reserve comment field
ESC DW d1...NUL	1B 48 57 d1...00	27 68 87 d1...0	State comment field data
ESC E	1B 45	27 69	Clear all label fields
ESC GC g1	1B 47 43 g1	27 71 67 g1	Clear graphics field
ESC GS g1...g8	1B 47 53 g1...g8	27 71 83 g1...g8	Reserve graphics field
ESC GW g1...gn	1B 47 57 g1...gn	27 71 87 g1...gn	State graphics data
ESC LC l1	1B 4C 43 l1	27 76 67 l1	Clear ruler line area
ESC LS l1...l10	1B 4C 53 l1...l10	27 76 83 l1...l10	Set ruler line data
ESC M n1 n2	1B 4D n1n2	27 77 n1 n2	Top-of-form detection
ESC P n1	1B 50 n1	27 80 n1	Print label (block)
ESC X n1 n2	1B 58 n1 n2	27 88 n1 n2	Sense TOF position
ESC x n1 n2	1B 78 n1 n2	27 120 n1 n2	Set internal TOF counter
ESC Y n1 n2	1B 59 n1 n2	27 89 n1 n2	Set print start position
ESC Z	1B 5A	27 90	Go to next top of form

NOTE 1 — *Incomplete commands received by the printer (example "ESC+&") will place the printer in a waiting mode. Power OFF/ON is required to reset the printer into operating mode again.*

NOTE 2 — *Invalid commands (1 byte or multiple bytes) sent to the printer will be ignored or printed in ASCII representation.*

13 MISCELLANEOUS

Paper feed	Form feed with printout of default parameters through push button on printer chassis
Communications	Serial interface, 10 pole edge connector Parallel interface, 40 pole edge connector Adapter cable from edge connector to 9-pole D-sub (serial) and 36-pole Amphenol (parallel) are available as accessories.
User profile	Operational 24 hrs x 365 days/year. Average 200 documents/day. 100-200 mm long documents (4-8"). 20% of print line dots used.
MDBF	TTP 52x0/60 and -/80 170.000 documents TTP 52x0/112 140.000 documents
Useful life	7 years at specified user profile and duty cycle
MTTR	30 minutes
Packing	Recycable corrugated natural brown cardboard carton and support structure, or molded CFC-free packing foam suitable for landfill or incineration purposes. Shipped on reusable Euro pallets up to 6 printer carton layers high. Sealing tape and pallet wrapping made of Polypropylene

14 OPERATOR CONTROLS

Form feed button	Push button that, when depressed at power ON, prints, cuts and presents a test document. Keeping the button pressed produces successive test documents. The test documents will contain various data such as firmware versions, default parameters, loaded fonts, loaded logotypes, and free space in flash PROM.
Printhead release lever	The printhead is separated from the paper when the head release lever is in its lower (horizontal) position. This enables the operator to load paper by feeding it through the print module manually. Information about the lever position is included in the status message. Printing, cutting, and paper feed is inhibited as long as the printhead is lifted.

15 SERIAL INTERFACE

The control board is equipped with a 10-pole ribbon cable type connector. The pinout of this connector is designed to mate with a standard D-sub 9-pole male connector through a straight ribbon cable accessory (5500-F0060). The pinouts of the 10-pole connector and the 9-pin D-sub connector are shown in the following table:

Pin No.	D-sub	Signal name	Direction	Description
1	1	—	—	Not connected
2	6	—	—	Not connected
3	2	RXD	To printer	Receive data
4	7	RTS	From printer	Request to send
5	3	TXD	From printer	Transmit data
6	8	CTS	To printer	Clear to send
7	4	DTR	From printer	Data terminal ready
8	9	—	—	Not connected
9	5	GND	Ground	
10		—	—	Not connected

Pins 4 and 7 are interconnected in the 10-pole connector.

The printer indicates that it is powered ON by setting DTR high. When initialized, RTS will be set high to indicate to the computer that it is ready to receive data. RTS will be set low when the buffer is almost full, thereby telling the computer to stop sending data until RTS is pulled high.

Communication parameters:

8 data bits
1 start bit
1 stop bit
ODD, EVEN or NO parity (as defined in the default parameter setting, see Installation Manual))
1200 — 57600 baud –"–

The following figure and table show the design of the serial interface adapter cable (accessory) that can be connected to the 10-pin control board connector. The other end of the cable can be fixed to a bracket on the paper roll holder.

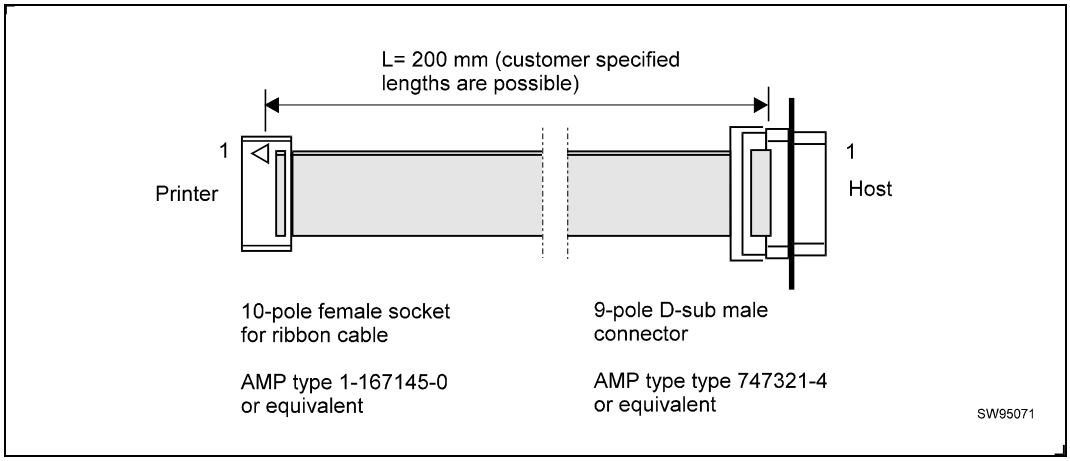


Figure 6. Serial interface adapter cable 5500-F0060 (accessory)

Printer			PC		
10-p.	9-p. D-sub	Signal	Signal	25-p. D-sub	9-p. D-sub
3	2	RXD	TXD	2	3
5	3	TXD	RXD	3	2
4	7	RTS	CTS	5	8
7	4	DTR	DSR	6	6
9	5	GND	GND	7	5

NOTE! *— Pins 4 and 7 on the 10-pin connector are connected with a jumper. This allows handshaking using either DTR/DSR or RTS/CTS signals, or both methods.*

16 PARALLEL PRINTER INTERFACE

The control board parallel interface is a 40-pole ribbon cable type connector. The printer can be connected to a standard Centronics 36-pole connector using a straight ribbon cable such as the adapter cable 5400-B0100 (see figure 8), available as an accessory. The following table shows the pin assignment in the 40-pole connector:

(The table continues on the next page)

40-pole conn.	Centronics	Signal	Direction	Description
1	1	STROBE	To printer	Strobe signal
3	2	D0	To printer	Data bit 0
5	3	D1	To printer	Data bit 1
7	4	D2	To printer	Data bit 2
9	5	D3	To printer	Data bit 3
11	6	D4	To printer	Data bit 4
13	7	D5	To printer	Data bit 5
15	8	D6	To printer	Data bit 6
17	9	D7	To printer	Data bit 7
19	10	ACK	From printer	Acknowledge signal
21	11	BUSY	From printer	Busy signal
23	12	Paper out	From printer	Paper out signal
25	13	Select	From printer	Selected (on line)
26	31	Init	To printer	Printer initialization
27	14	Autofeed	To printer	Not used in this printer
28	32	ERROR	From printer	Error signal
35	18	+5V	From printer	+5V through 47 kohm
36	36	Select In	To printer	Not used in this printer
2	19	GND		
4	20	GND		
6	21	GND		
8	22	GND		
10	23	GND		
12	24	GND		
14	25	GND		
16	26	GND		

40-pole conn.	Centronics	Signal	Direction	Description
18	27	GND		
20	28	GND		
22	29	GND		
24	30	GND		
30	33	GND		
31	16	GND		
33	17	Frame GND		
29	15			Not connected
32	34			Not connected
34	35			Not connected
37				Not connected
38				Not connected
39				Not connected
40				Not connected

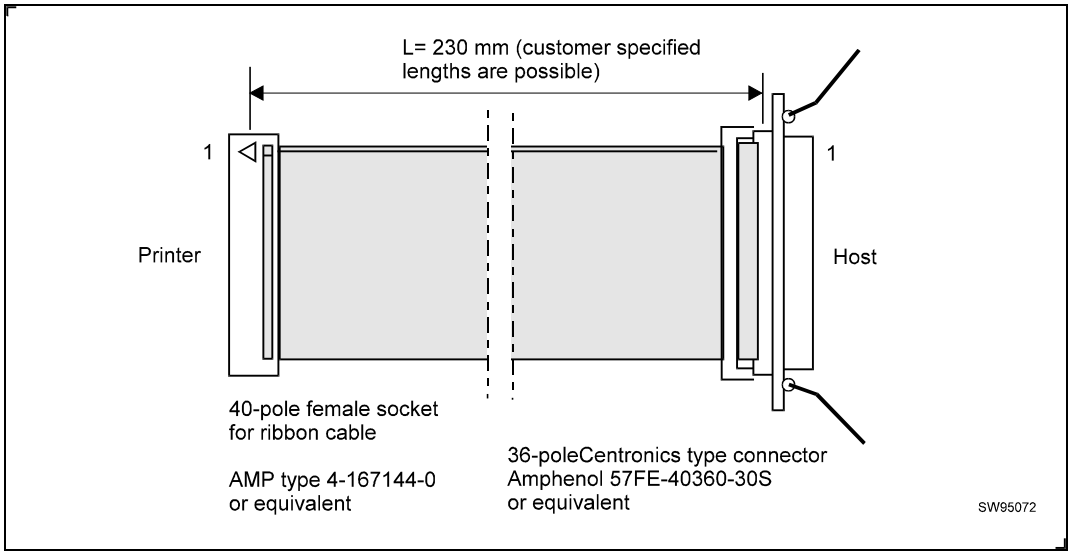


Figure 7. Parallel interface adapter cable 5400-B0100 (accessory)

17 PRINTER DIMENSIONS

All measurements are in mm.

17.1 Standard roll holder

The standard paper roll holder, with attached switch button bracket, can be turned symmetrically 180º so that the roll has to be installed from the right hand side (as viewed from the front of the printer). This also means that the paper feed button, and the connector support bracket for an optional interface adapter cable, will be positioned on the left-hand side of the printer.

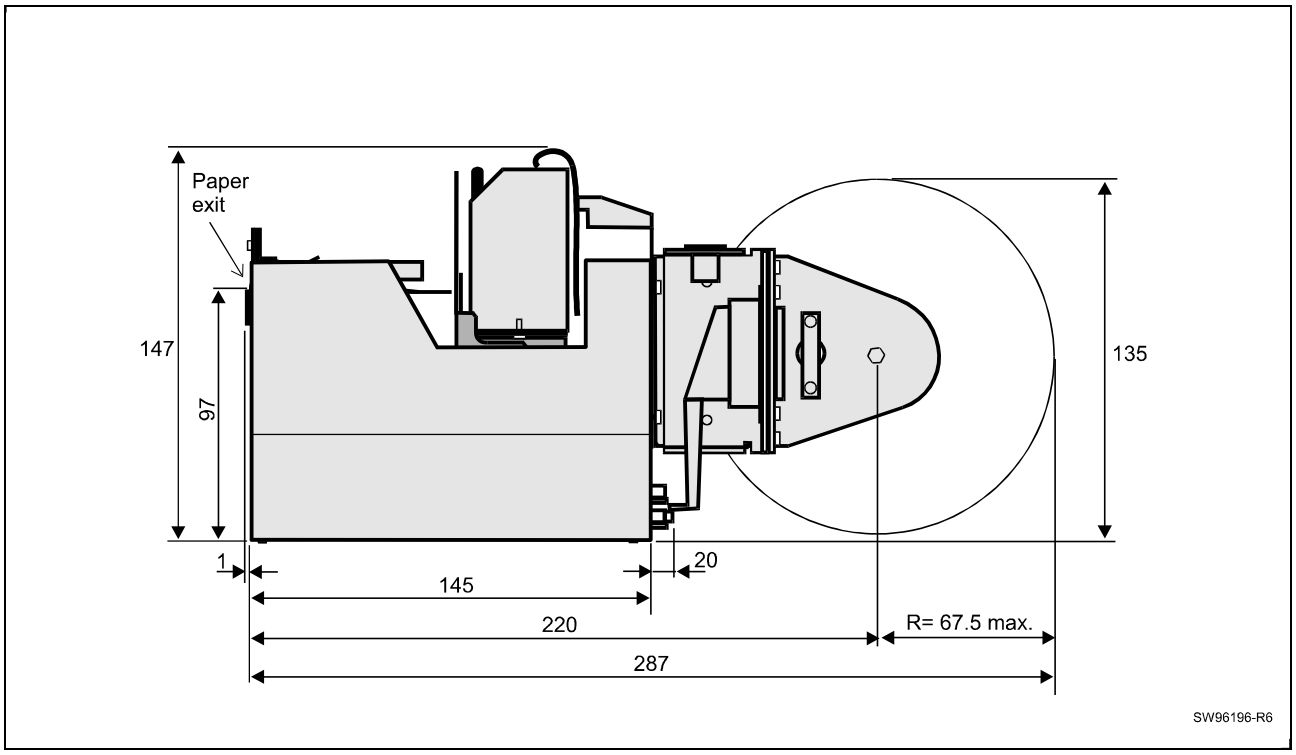
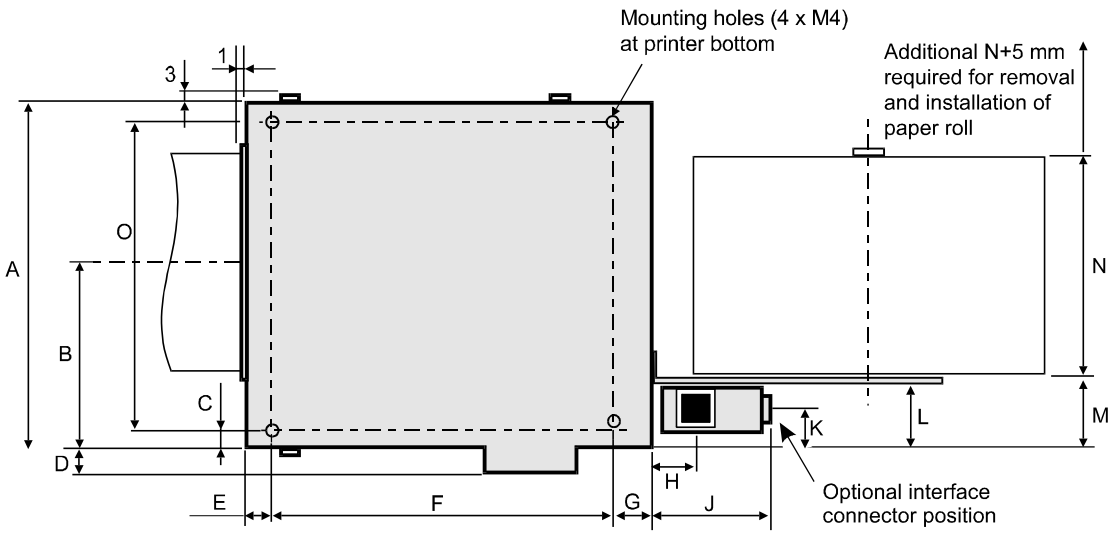


Figure 8. Side view. Dimensions applicable to all basic TTP 52x0 models



	TTP 52xx/60	TTP 52xx/80	TTP 52xx/112
A	128	128	160
B	67	67	83
C	7	7	16
D	–1	7	7
E	9	9	6
F	120	120	133
G	15	15	6
H	21	21	21
J	58	58	58
K	6	6	6
L	25	25	25
M	37	27	27
N	60	80	112
O	115	115	129

SW96197-R5

Figure 9. Top view, standard roll holder for up to 135 mm roll diameter

17.2 Optional drop-in roll holders

The optional drop-in roll holders, does not require additional space sideways to load new paper rolls.

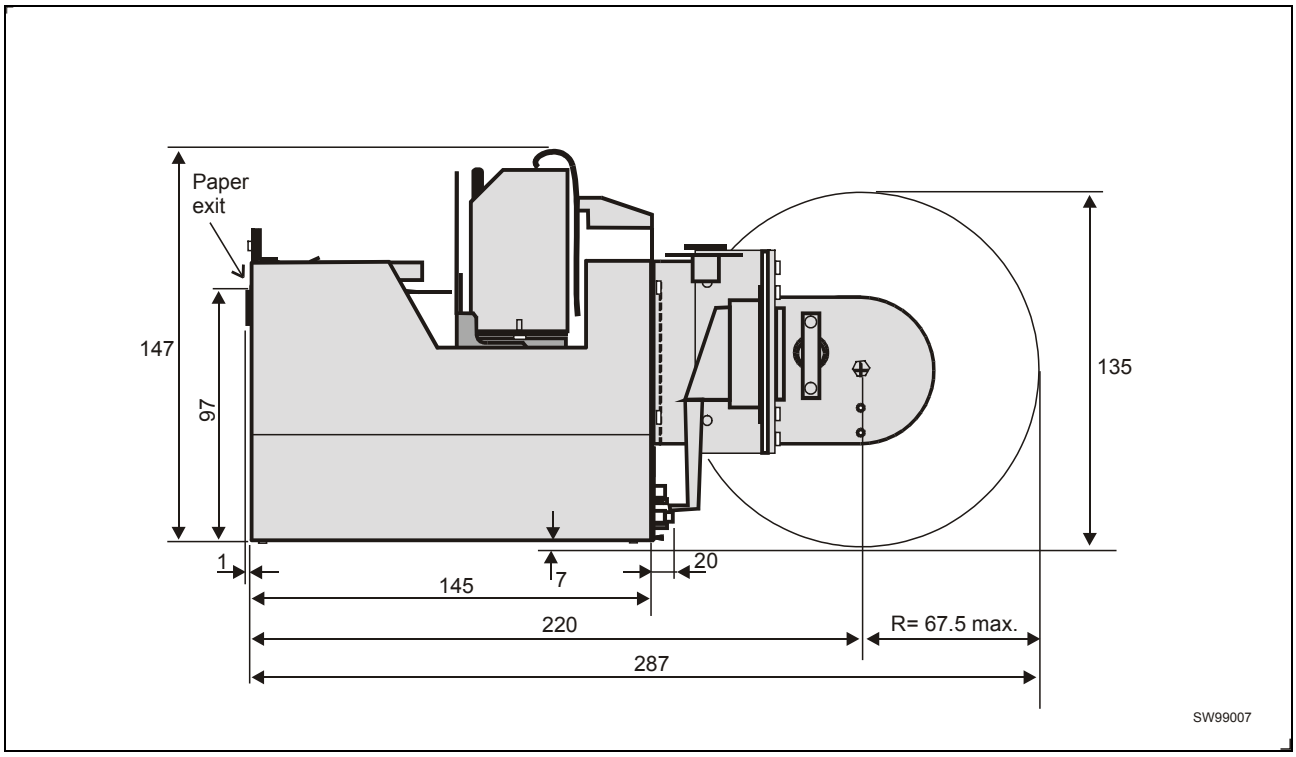


Figure 10. Top view, optional drop-in roll holder for up to 135 mm roll diameter

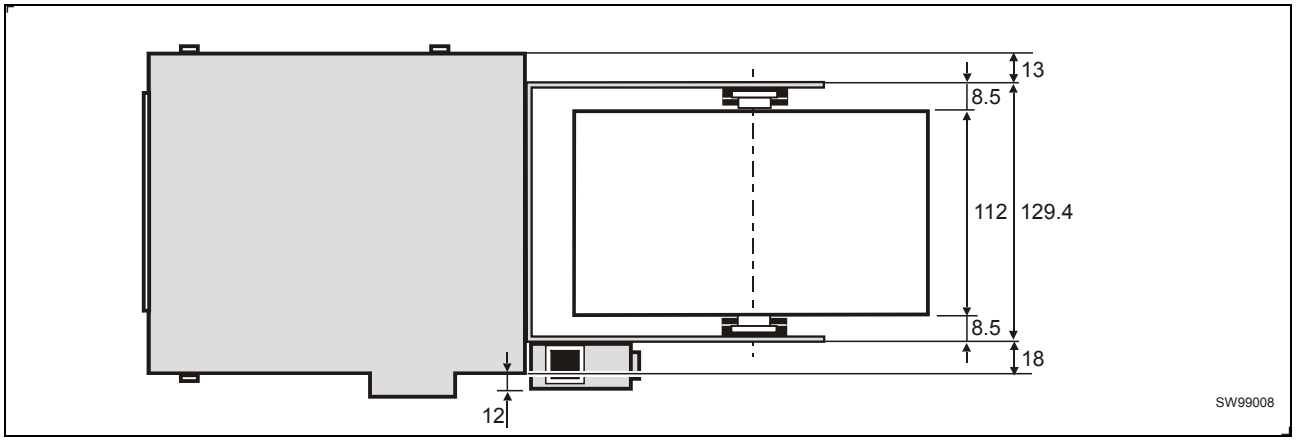
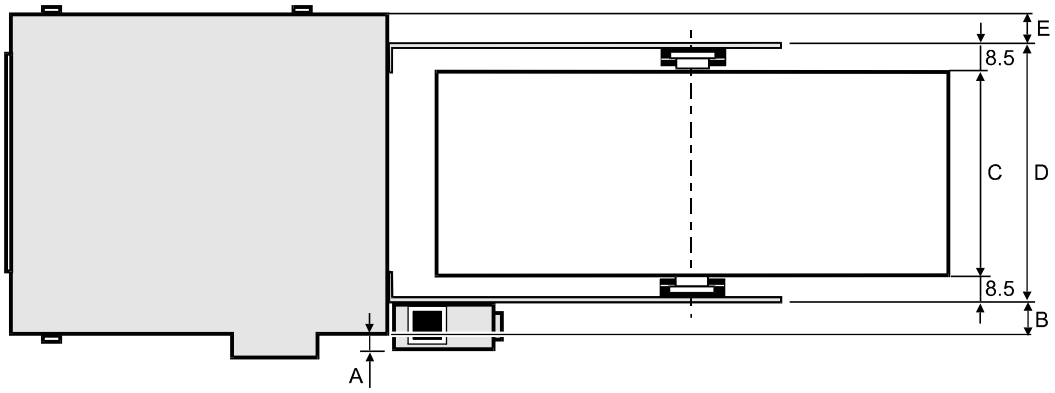


Figure 11. Top view, optional drop-in roll holder for up to 135 mm roll diameter



	TTP 52xx/60	TTP 52xx/80	TTP 52xx/112
A	–2	–12	–12
B	28	18	18
C	60	80	112
D	77	87	129
E	23	13	13

SW95020F-R1

Figure 12. Top view, optional drop-in roll holder for up to 200 mm roll diameter

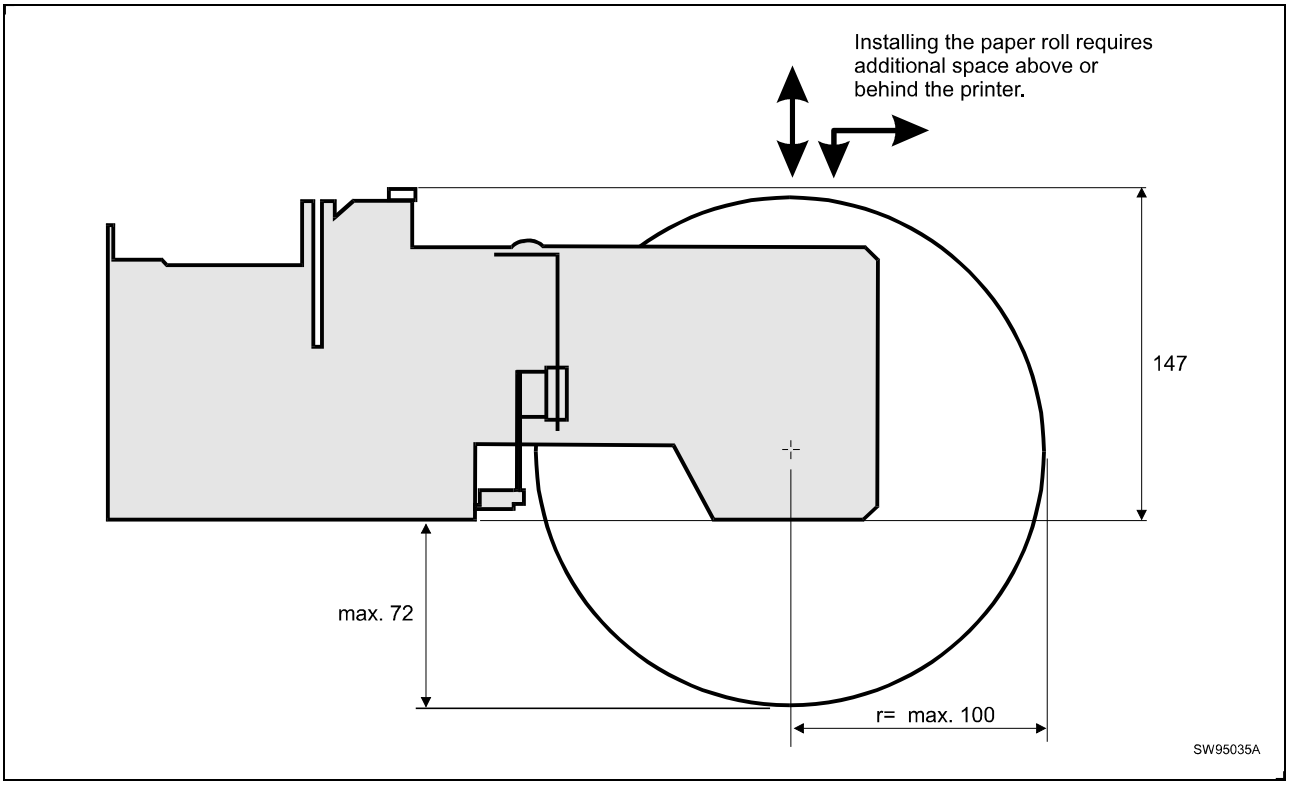


Figure 13. Side view, optional drop-in holder for up to 200 mm roll diameter

18 BASIC CHARACTER SET

The table below shows the basic characters stored in the flash PROM on the printer control board. The characters in the shaded positions can be substituted with characters from one of several national character sets if 7-bit communication is used. See page 26.

	Hex (1st digit)	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. (2nd digit)	Dec. value (horiz. + vert.)	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
0	0	NUL			0	@ 3	P	` 8	p	Ç	É	á	▒	└	╨	α	≡
1	1			!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	2			”	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	3			# 1	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	4			$ 2	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	5			%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	6	ACK		&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	7			´	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	8		CAN	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	9			)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	·
A	10	LF		*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	11		ESC	+	;	K	[4	k	{ 9	ï	¢	½	╗	╦	█	δ	√
C	12			,	<	L	\ 5	l	| 10	î	£	¼	╝	╠	▄	∞	n
D	13	CR		-	=	M	] 6	m	} 11	ì	¥	¡	╜	═	▌	φ	²
E	14			.	>	N	^ 7	n	~ 12	Ä	Pt	«	╛	╬	▐	ε	■
F	15	NAK		/	?	O	_	o	€	Å	ƒ	»	╖	╧	■	∩	

19 NATIONAL CHARACTER SETS

This table lists national substitute characters stored in the flash PROM on the printer control board. The position numbers refer to the boxed cells in the table showing the basic character sets. See page 25.

The applicable character set is selected with the ESC+R+n command.

NOTE! *— These character sets has been included only to create compatibility with the TTP 5000 printer model. The command only applies in 7-bit communications environments. It has no effect in modern 8-bit communication where the IBM II character set with 256 characters applies.*

Pos. No.	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***
Hex.	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
Dec.	35	36	64	91	92	93	94	96	123	124	125	126
Character set												
1. USA	#	$	@	[	\	]	^	`	{	|	}	~
2. Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3. Great Britain	£	$	@	[	\	]	^	`	{	|	}	~
4. France	#	$	à	°	ç	§	^	`	é	ù	è	¨
5. Spain 1	₧	$	@	¡	Ñ	¿	^	`	"	ñ	}	~
6. Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
7. Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
8. Denmark 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
9. Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10. Denmark 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11. Spain 2	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
12. Latin America	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú
13. Japan	#	$	@	[	¥	]	^	`	{	|	}	~